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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,783	09/23/2003	Hugh Walsh	MP0343	6403
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MCGUIREWOODS, LLP 1750 TYSONS BOULEVARD SUITE 1800 MCLEAN, VA 22102			JUNTIMA, NITTAYA	
		ART UNIT		PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/669,783	WALSH, HUGH	
	Examiner	Art Unit	
	Nittaya Juntima	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 17 September 2007.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-4,6-17,19-28,30-34 and 36-52 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-4,6-17,19-28,30-34 and 36-52 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 17 September 2007 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

1. This action is in response to the amendment filed on 9/17/2007.
2. Claims 1-4, 6-17, 19-28, 30-34, and 36-52 are pending.
3. Claims 37-48 are currently rejected under 35 U.S.C. 112, first paragraph.
4. Claims 1-4, 6-17, 19-28, 30-34, and 36-52 are currently rejected under 35 U.S.C. 112, second paragraph.
5. The indicated allowability of claims 5-6, 18-19, and 29-30 is withdrawn in view of the newly discovered reference(s) to an art of record, Erimli (US 6,405,258 B1). Claims 1-4, 6-17, 19-28, 30-34, and 36, 49-52 are currently rejected under 35 U.S.C. 103(a). Rejections based on the newly cited reference(s) follow.

Claim Objections

6. Claims 1, 6, 19, 30, and 33 are objected to because of the following informalities:
 - in claim 1, line 3, “of in” should be changed to “in”;
 - claim 6 is identical to claim 3 and should be canceled;
 - claim 19 is identical to claim 16 and should be canceled;
 - claim 30 is identical to claim 27 and should be canceled;
 - claim 36 is identical to claim 33 and should be canceled.

Appropriate correction is required.

Specification

7. The disclosure is objected to because of the following informalities:

The amendment filed 9/17/2007 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

- The claim limitations recited in amended claims 37-38 and 44-45 lack antecedent basis in the specification and introduces new matter into the specification; the claim subject matter of amended claims 37-38 and 44-45 appears to be related to *an upstream node and its operations in response to the reception of the pause frame and the pause release frame* which are cited in paragraphs 0011 and 0012 (no mention of a plurality of counters in an upstream node) of the Summary section, but *not* disclosed in the Detailed Description section of the specification (Fig. 4 and paragraphs 0029-0034 and Fig. 7B and paragraph 0050 as cited in the Remarks dated 9/17/2007 teach only a network switching device having a plurality of counters and an egress module that receives the data from an upstream device at its ingress module and performs flow control on the channel connected to an upstream device by transmitting a pause frame and a pause release frame to the upstream device via the channel using its egress module).

- Note that Fig. 1 shows that switch 102 is connected to devices 104A and 104B, Fig. 4 shows the details of switch 102, and Figs. 7A and 7B show the method implemented by switch 102 that transmits a pause frame and pause release frame to an upstream node. Thus, assuming that the data is transmitted from device 104A to device 102B via switch 102, *nowhere in the*

specification teaches a network switching device (whether 104A or 102 in Fig. 1) that contains (i) *a plurality of counters*, (ii) *an egress module* that generates a pause frame and a pause release frame, ceases to transmit the frame of data to be paused, and resumes transmitting the frames of data to be released, (iii) *an ingress module* that receives the pause frame and the pause release frame generated by the egress module *within the same device* as recited in the amended claims 37-38 and 44-45. In other words, the specification does not teach a network switching device that performs a flow control on itself by sending a pause frame and a pause release frame to itself based on the counters and corresponding thresholds.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 37-48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. Although the specification discloses a network switching device comprising a plurality of counters, an egress that generates a pause frame and a pause release frame based on the counters and the corresponding thresholds (Figs. 4, 7A, and 7B), the specification fails to disclose the network switching device that comprises the egress module that also ceases to transmit the frames of data to be paused and resumes transmitting the frames of data to be released, and an ingress module that receives the pause frame and the pause release frame both generated by the egress module *in the same network switching device* as recited in

claims 37-38 and 44-45 in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4, 6-17, 19-28, 30-34, and 36-52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, lines 6-7, the limitation "enqueue each of the buffers to the one of more queues" is vague and indefinite as it is unclear how can buffers be enqueued to queues. In other words, how can a buffer itself, which is a hardware - a memory location, be enqueued to a queue which is a FIFO organized sequence of data? The office is interpreting the limitation as "enqueue each of the buffers by sending a pointer for each of the buffers to the one of more queues" in order to be consistent with paragraph 0044 of the specification. Similarly, the same rejection applies to independent claims 14 (lines 6-7), 25 (lines 5-6), 31 (lines 9-10), 37 (one of the buffers is enqueued in lines 5-6), 44 (enqueueing one or more buffers in line 4), 49 (enqueueing one or more buffers in line 3), and 51 (enqueueing one or more buffers in line 8).

In claim 42, line 2, "the memory" lacks antecedent basis.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-2, 7-11, 14-15, 20-22, 25-26, 31-32, 49, and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over an art of record, Erimli (US 6,405,258 B1).

Regarding claim 1, Erimli teaches a network switching device (multiport switch 12, Fig. 1) comprising:

An ingress module (the MAC unit 20, Fig. 2) configured to receive frames of data from a channel (RMII 18, Fig. 1) and store the frames in one or more buffers (buffers located in the external memory 36, Fig. 1). See col. 5, lines 14-27 and col. 6, lines 17-28. Wherein each frame of data has one or more plurality of classes of service (high priority frames and low priority frames, col. 6, lines 54-62).

One or more queues (output queues 58, Fig. 2, col. 8, lines 43-50).

A forwarding module (the port vector FIFO 56, Fig. 2) configured to enqueue each of the buffers by sending a pointer (the frame pointer) for each of the buffers to the one or more queues (output queues 58, Fig. 2) after the ingress module stores the data frames in one or more of the one or more buffers. See col. 15, lines 6-10.

An egress module (output port 90a, Fig. 6) configured to exercise a flow control (generates and transmit a PAUSE frame) on the channel for each of the classes of service when the number of queue entries for the class of service exceeds a predetermined threshold for the class of service (col. 15, lines 11-46; see also col. 12, lines 57-61).

Although Erimli teaches (i) keeping track of the number of entries/frame pointers currently stored in the output queues 58, Fig. 2 for the respective queue priority, (ii) comparing the number the respective queue entries to the corresponding threshold value in order to determine whether to implement flow control (col. 11, lines 65-col. 12, lines 37, 57-61, col. 15, lines 11-42), and (iii) returning the frame pointer after transmitting the data stored in a buffer for a frame received from the channel and having the respective class of service from the network switching device (fetching the frame data from the location in external memory 36 and storing the frame data into the transmit FIFO, then returning the frame pointer to the free buffer queue 64, col. 9, lines 4-23), Erimli does not explicitly teach that the tracking number of queue entries is done by using a plurality of counters, storing a corresponding count, incrementing the count when the forwarding module enqueues one of the buffers, and decrementing the count after the stored data is transmitted, and exercising flow control when the count for the class of service exceeds the threshold as recited in the claim.

However, an Official notice is taken that it is a common practice and well known in the art to use counters to quantitatively keep track of the number of queue/buffer entries represented by a count by incrementing a count when data (e.g., a pointer) is stored into one of the queue/buffer entries and decrementing the count when data (e.g., a pointer) is removed from the queue/buffer entry.

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of Erimli to apply the concept of tracking the number of queue/buffer entries including incrementing and decrement count such that a plurality of counters comprising one counter for each of the classes of service wherein each of the counters is

configured to store a count for the channel for a respective one of the classes of service, increment the count when the forwarding module enqueues one of the buffers storing the data of one of the frames having the respective class of service, and decrement the count after the data stored in a buffer for a frame received from the channel and having the respective class of service is transmitted from the network switching device, and exercising flow control when the count for the class of service exceeds the threshold by the egress module would be included as claimed. The suggestion/motivation to do so would have been to quantitatively track the number of queue entries (i.e., frame pointers) for each class of service using a count.

Regarding claim 2, Erimli also teaches that, wherein, to exercise flow control for one of the classes of service, the egress module (output port 90a, Fig. 6) is further configured to send a pause frame (PAUSE frame) to the channel (RMII 18, Fig. 1 connecting first network station 14a), and wherein the pause frame indicates the one of the classes of service (the PAUSE frame includes Opcode field indicating whether the PAUSE frame corresponds to the high or low priority threshold value). See col. 15, lines 37-46; see also col. 12, lines 57-61 and col. 13, lines 36-40.

Regarding claim 10, Erimli also teaches a memory external memory 36, Fig. 1 comprising the buffers (col. 6, lines 17-28).

Claims 8, 14, 15 are network switching device claims containing similar limitation as recited in device claims 1, 1, 2, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 1, 1, 2, respectively.

Claims 7, 11, and 20 are integrated circuit (CPU 32, SSRAM 36, and multiport switch 12 in Fig. 1 constitute an integrated circuit) claims comprising the network switching device of claims 1, 10, and 14, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 1, 10, and 14, respectively.

Claim 21 is a network switch (CPU 32, SSRAM 36, and multiport switch 12 in Fig. 1 constitute a network switch) comprising the network switching device of claim 14 and is therefore rejected under the same reason set forth in the rejection of claim 14.

Claims 9 and 22 is output-queued network switch (CPU 32, SSRAM 36, and multiport switch 12 in Fig. 1 constitute an output-queued network switch) claims comprising the network switching device of claims 1 and 14, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 1 and 14, respectively.

Claims 25-26 are method claims corresponding to device claims 1-2, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 1-2, respectively.

Claims 31 and 32 are computer readable medium claims containing instructions for controlling an apparatus similar to device in claims 1 and 2, respectively and are therefore rejected under the same reason set forth in the rejection of claims 1 and 2, respectively with an exception that Erimli does not teach that the instructions are executable by a computer and embodied in a computer program stored on a computer readable medium. However, an Official notice is taken that it is well known in the art to implement the instructions as a computer program to be executable by a computer and store on a computer readable medium for easy installation and portability purposes. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of Erimli such that the instructions would be executable by a computer and embodied in a computer program stored on a computer readable medium as claimed for easy installation and portability purposes.

Claims 49 and 51 are a method claim and a computer readable medium claim corresponding to device claim 2 and computer readable medium claim 32, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 2 and 32, respectively, with an addition step of ceasing to transmit the frames of data having the one or more classes of service to be paused (the PAUSE frame causes the first network station 14a, Fig. 1 to discontinue transmission of data frame, col. 15, lines 44-47).

12. Claims 3-4, 6, 12-13, 16-17, 19, 23-24, 27-28, 30, 33-34, 36, 50 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over an art of record, Erimli (US 6,405,258 B1) in view of Feuerstraeter (hereinafter "Feuer") (US 2003/0123393 A1).

Regarding claims 3/6 and 4, Erimli does not teach that the egress module is further configured to terminate flow control on the channel for each of the classes of service by sending a pause release frame indicating the one of the classes of service when the count for the class of service but not yet transmitted from the network switching device falls below a further predetermined threshold.

However, in an analogous art of flow control, Feuer teaches that a flow control agent 214 in Fig. 2 (equivalent to the egress module) performs a flow control by generating a control message in order to suspend transmission of content having a priority level associated with buffer queue 302, 304, or 306 in Fig. 3 (equivalent to the buffers storing frames of data having the class of service) whose number of occupied memory locations has reached a threshold 308 (paragraphs 32-33) and issuing a revised control command (equivalent to a pause release frame) denoting the priority level associated with the buffer queue that becomes available/falls below threshold 308 and transmitting it via channel 106 in Fig. 1 (paragraph 21) to an upstream device when the buffer queue associated with the priority level becomes available/falls below threshold 308, Fig. 3 in order to refresh a disable of communicate (paragraph 44, see also paragraphs 33 and 39, lines 15-22) (equivalent to terminating flow control on the channel for each of the classes of service by sending a pause release frame indicating the one of the classes of service when the count for the class of service falls below a further predetermined threshold for the class of service).

Given the teaching of Feuer, it would have been obvious to one skilled in the art at the time of the invention to further modify the teaching of Erimli to apply the concept of issuing a

revised control command such that the egress module would be further configured to terminate flow control on the channel for each of the classes of service by sending a pause release frame indicating the one of the classes of service when the count for the class of service but not yet transmitted from the network switching device falls below a further predetermined threshold as claimed. The suggestion/motivation to do so would have been to enable the transmission when the buffer (e.g., queue) associated with the priority level becomes available/falls below the threshold as taught by Feuer (paragraph 44).

Regarding claims 12 and 13, Erimli teaches a reserve module (output queue 58 in Fig. 2/400, Fig. 5A) configured to reserve one or more buffers (one or more buffers reads on a maximum number of memory location(s) in output queue 58/400, Fig. 5A that are allocated for storing frame pointers, col. 15, lines 6-43; see also col. 12, lines 15-22) to the channel (RMII 18, Fig. 1), wherein a pause threshold/a pause release threshold (both are not further defined, read on a value of the low priority watermark threshold for triggering the transmission of a PAUSE frame) for the channel is a function of the number of the buffers reserved to the channel (a value of the low priority watermark threshold is a maximum number of entries that are allowed in the output queue; col. 12, lines 15-22 and col. 15, lines 22-43).

Claims 16/19, 17, and 23/24 are network switching claims containing similar limitation as recited in device claims 3, 4, and 13, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 3, 4, and 13, respectively.

Claims 27/30 and 28 are method claims corresponding to device claims 3 and 4, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 3 and 4, respectively.

Claims 33/36 and 34 are computer readable medium claims containing instructions for controlling an apparatus similar to device in claims 3 and 4, respectively and are therefore rejected under the same reason set forth in the rejection of claims 3 and 4, respectively.

Claims 50 and 52 are method claim and computer readable medium claim corresponding to device claim 3 and computer readable medium claim 34, respectively, and are therefore rejected under the same reason set forth in the rejection of claims 3 and 34, respectively, with an addition step of resuming transmitting the frames of data having the one or more classes of service to be released which is not taught by Erimli.

However, as shown in Fig. 7, Feuer teaches that when a revised control command in step 714 of Fig. 7 is received by an upstream device, the transmission of additional content according to the priority level is resumed by the upstream device in step 706, paragraph 44 (equivalent to resuming transmitting the frames of data having the one or more classes of service to be released).

Therefore, it would have been obvious to one skilled in the art at the time of the invention to further modify the combined teaching of Erimli and Feuer such that the step of resuming transmitting the frames of data having the one or more classes of service to be released would be

included. The suggestion/motivation to do so would have been to enable data to be received when the priority level that has been oversubscribed becomes available again.

Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Nittaya Juntima
December 31, 2007

N5


HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600